

## **ABSTRACT**

The present invention relates to the design, preparation and use of cascade regulatory circuits for amplification of gene expression. The genetic circuit is based on a plurality (e.g., two or more) of regulatory genes organized in a hierarchical order of expression in a genetic construct or constructs, which can be established in a cell, e.g., a gram-negative bacteria, by means of autoreplicative vectors or by chromosomal insertion. In one embodiment, the genetic construct(s) can be stably maintained in the chromosome without selective pressure, and gene expression induced three orders of magnitude therefrom using economical biodegradable benzoate derivatives.